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Dt: 25.09.2007

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Confidential

To
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Head, Quality Assurance Centre
Universitas Terbuka,
Jalan Cabe Raya,
Pumulang, Tangerang- 15417,
Indonesia.

Dear Professor,

Sub: Department of Education – Ph.D. thesis sent for valuation- reg.
Ref: Your acceptance letter addressed to Dr.P.Sivakumar, dated 25.07.07

By direction, I am sending herewith the Ph.D. thesis entitled "DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL " .

You are requested:

- i) to evaluate the thesis *WITH IN SIXTY DAYS FROM THE DATE OF RECEIPT OF THIS THESIS*
- ii) to give **duly signed detailed report** in *two copies*, which may contain your specific remarks on the thesis including merits and demerits of the study.
- iii) to give your specific comments on the grading commendation in the enclosed prescribed format, in *two copies*.

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Your kind cooperation is solicited for early publication of results, on the lines suggested above.

Kindly acknowledge the receipt of this thesis.

Yours Sincerely

REGISTRAR

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Encl:

1. Thesis - 1 no.
2. Evaluation Report - 2 nos.
3. Acquittance slip
4. Evaluation rules
5. Acknowledgement letter



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PROFORMA FOR ADJUDICATION OF THE PH.D.THESIS

1. Name of the candidate : A. EDWARD WILLIAM BENJAMIN
2. Title of the thesis : Development of Interactive Multimedia CD Based Learning Courseware for Learning Physics at Higher Secondary level.
3. Discipline and subject : Education
4. Name and address of Examiner : Dr. Aminudin Zuhairi
Universitas Terbuka, Indonesia
5. Recommendation of the Examiner :
(Please strike out whichever are not applicable)

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(or)

b) Thesis is "Commended"

Aminudin Zuhairi

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~~c) Thesis is commended and Degree may be awarded subject to the condition of furnishing satisfactory clarification to the queries during the public viva-voce examination~~

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Place : Jakarta, Indonesia

Date : 21/01/08

Aminudin Zuhairi
AMINUDIN ZUHAI RI
(Signature of the Examiner
with Designation)



ALAGAPPA UNIVERSITY

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KARAIKUDI.

PROFORMA FOR ADJUDICATION OF THE PH.D.THESIS

1. Name of the candidate : A. EDWARD WILLIAM BENJAMIN
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~~e) Thesis is not commended for the award of the Degree.
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Please make sure that you have indicated any one of the options given in a), b) c), d), e) before affixing your signature below and enclosed detailed report on the thesis.

6. Any other remarks :

I have read this thesis with pleasure, and it has addressed important issues in the topic being investigated.

Place: Jakarta, Indonesia

Date : 21/01/08

AMINUDIN ZUHARI
(Signature of the Examiner
with Designation)

DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL

THESIS SUBMITTED TO ALAGAPPA UNIVERSITY
IN PARTIAL FULFILMENT FOR THE AWARD OF
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN EDUCATION

BY

A. EDWARD WILLIAM BENJAMIN

RESEARCH SUPERVISOR

Dr. P.SIVAKUMAR



College of Education
ALAGAPPA UNIVERSITY
Accredited With 'A' Grade by NAAC
Karaikudi-630 003
India

June-2007

**DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD
BASED LEARNING COURSEWARE FOR LEARNING
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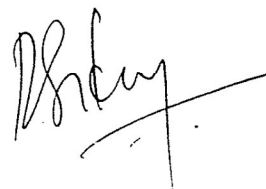
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Deputy Director, Centre for Adult, Continuing Education and Extension,
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Reader in Education,
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Karaikudi – 630 003.

CERTIFICATE

This is to certify that the thesis entitled *"DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL"* submitted by **A.EDWARD WILLIAM BENJAMIN** for the award of Doctor of Philosophy is a record of research work done under my guidance and supervision during the period of 2005-2007 and the dissertation has not formed the basis for the award to the Scholar of any Degree, Diploma, Associateship, Fellowship or any other similar title.

Also certified that the dissertation represents an independent work on the part of the candidate.

(DR.P.SIVAKUMAR)



Karaikudi

Date : 20-06-07

RESEARCH SUPERVISOR

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Karaikudi – 630 003

DECLARATION

I hereby declare that the thesis entitled *“DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL”* submitted to ALAGAPPA UNIVERSITY for the award of the degree of Doctor of Philosophy in Education is my original work and that it has not previously formed the basis of the award of any degree, Diploma, Associateship, Fellowship or any other similar title of the University or Institution.

A. EDWARD WILLIAM BENJAMIN

ACKNOWLEDGEMENT

"All knowledge and wisdom comes from God the father, who is seated above all the heavens".

At the outset, I thank God, the father for giving me the wisdom to carry out this experiment.

First of all, I would like to express my sincere sense of gratitude to my guide Dr. P.Sivakumar, Deputy Director, Centre for Adult, Continuing Education and Extension, Alagappa University and Reader in Education, Alagappa University College of Education, Karaikudi, for his valuable guidance and support in helping me to complete my research work successfully.

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Dedicated to the Almighty

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NEWLY DEVELOPED INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE.

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14: 7 7 700 22

Registrar

Alagappa University - India

Evaluation of Ph.D. Thesis submitted to College of Education Alagappa University, India

**"DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING
COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL" by A.
Edward William Benjamin (Research Supervisor: Dr. P. Sivakumar), June 2007**

I have read with great pleasure the thesis entitled "Development of Interactive Multimedia CD Based Learning Courseware for Learning Physics at Higher Secondary Level" by A. Edward William Benjamin with great pleasure. The author has addressed an important issue in the educational field which has significant values to improved understanding of the theories and best practices in education, particularly the development of interactive multimedia courseware for learning physics at schools.

The teaching of science, particularly physics as the author's investigation has been focused, is an area which has continually received attention and emphasis from stakeholders. The author is concerned with ways and methods of responding to challenges of knowledge explosion through the use of information and communication technology. This is a fundamental challenge to address in educational field. More comments and suggestions are presented as the followings.

Chapter I Introduction has addressed the fundamental issues in media, technology, the teaching of science, the teaching of physics, and the use of ICT, multimedia and interactive multimedia in the teaching of physics. The need, significance and scope of the study have been described adequately in this chapter.

However, Chapter I lacks of a clear statement on the fundamental research question(s) to be addressed in the research. Furthermore, the author also needs to state the objectives or aims of the study. These two issues are important to make sure that the author himself focuses his research endeavour to address the research questions and put himself on the track guided by the clearly stated problem and aims of the research.

Chapter II Conceptual Framework presents the framework and arguments on multimedia and interactive multimedia and their uses in education, electronic resources in education, and design aspects in the use of multimedia and interactive multimedia.

However, it is important for the author to note aspects that relate to sequential presentation of the conceptual framework. The whole thesis discusses interactive multimedia CD based learning courseware for learning physics at school. The conceptual framework should thus be presented beginning with discussion about interactive multimedia: what is it, why is it used, how is it developed, how is it used in learning physics at school? It is also important to address

the design and development of interactive multimedia. Then, discussions on issues relating interactive multimedia, such as type, uses, resources, and so forth can follow.

Chapter III reviews related literature and relevant research in multimedia and interactive multimedia in education, particularly the teaching of physics. The author has conducted extensive reviews, which include both literature and research in India as well as in the rest of the world outside India. This should give him with solid theoretical base in formulating his research questions, determining rationale for the study, and in conducting the study. This Chapter is well written by the author. It systematically discusses the relevant issues, critically analyses them, and thus enriches knowledge in the subject being investigated.

One important point which is not clearly dealt with in this chapter is how the author concretely relates the reviews of literature and research to the present study. Many of the literature reviews have focused on the benefits of using interactive multimedia, and a lot of evidence has been presented through research. The author needs to address in more details reviews of literature and research which specifically focus on the design and development of interactive multimedia. This should then be linked with the major hypothesis in Chapter IV, which states "The Interactive Multimedia CD Based Learning Courseware is an effective method of learning physics at higher secondary level" (p. 122). This chapter should thus address the questions such as: "What sort of interactive multimedia? How is it designed? How effective is it? What criteria of effectiveness in learning using interactive multimedia?"

Chapter IV elaborates the research methods, development of instruments, and administration of tests used to collect data. Chapter IV is well presented, elaborating the research methods, instruments, data collection techniques in detail. Elaboration of experiment and its prerequisites are nicely presented. The research design also depends on the conceptual framework and the review of literature and relevant research.

Chapter V presents analysis and interpretation of data, which includes methods of descriptive and differential analyses, results of hypothesis testing and discussion of findings. The author has used a variety of methods for data analysis, and discusses the findings in order to come to valid conclusions. Findings are clearly presented.

Chapter VI gives summary and conclusions, which sum up the whole research and provide the conclusions based on analysed data collected during the study. Good summary are presented and valid final conclusions are achieved using analyses data and findings in this study.

Having the whole thesis enthusiastically, I come to the final conclusion that overall this is a valuable thesis which contributes to improving our understanding of the use of interactive multimedia courseware for learning physics at secondary schools. The thesis has addressed important questions in the field, inspired readers to have better understanding of the field,

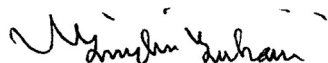
enriched knowledge in the field. It is original in nature so that it helps construct new knowledge in the use of interactive multimedia in the teaching of physics at school.

I wish to congratulate the author for this great work and important endeavour. The thesis is invaluable and of great interest for a person like myself and my colleagues at Universitas Terbuka (Open University) in Indonesia. I would like to keep the thesis at my institution and donate to our University library so that professionals working in the field in my institution can refer to it for future research and development of the field.

It has been a great pleasure to read the thesis. I recommend that the thesis is commended, and further actions by the University can follow.

Jakarta, Indonesia

20 February 2008



Aminudin Zuhairi, Ph.D.

Univesitas Terbuka